Decision **ALTERNATE PROPOSED DECISION OF PRESIDENT MICHAEL PICKER (Mailed 4/12/19)**

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions.	Rulemaking 13-02-008

ALTERNATE DECISION REGARDING BIOMETHANE TASKS IN SENATE BILL 840

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ALTERNATE DECISION REGARDING BIOMETHANE TASKS IN SENATE BILL 840

Summary

Today's decision addresses the actions required of the Commission, as set forth in Public Utilities Code Section 784.1. That law requires the California Public Utilities Commission to reevaluate its requirements and standards adopted pursuant to Section 25421 of the Health and Safety Code for injecting biomethane into common carrier pipelines. The law further states that, if appropriate, the Commission shall change its biomethane requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made by the California Council on Science and Technology's Senate Bill 840 study.

After careful consideration of the recommendations of the California Council on Science and Technology, we: (1) allow San Diego Gas & Electric Company and Southern California Gas Company to lower their heating value to 970 British Thermal Units (BTU)/standard cubic feet (scf) from 990 BTU/scf while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas for biomethane provided that a 970 heating value does not create any safety risks for end-user utility customers or compromise the gas pipeline system; (2) maintain the current siloxane limits until there is further evidence to justify modifying the limits, as it is appropriate in the interest of safety and pipeline integrity; (3) decline to adopt reduced siloxane verification requirements in the interests of public health and safety, pipeline interconnection integrity and safety, and continuity of regulation until there is further evidence and facts that demonstrate safety will not be compromised; and (4) decline to adopt a heating value exemption process. Our actions here are designed to

achieve full transparency about the health and safety impacts of biomethane development.

1. Background

The California Public Utilities Commission (Commission) established Rulemaking 13-02-008, to consider and adopt biomethane standards and requirements, pipeline open access rules, and related enforcement provisions pursuant to key legislative action. First, Assembly Bill (AB) 1900[1] amended and added several code sections to the Public Utilities Code[2] pertaining to biogas and biomethane. AB 1900 enacted Health and Safety Code Section 25421 which required the Commission to adopt standards for constituents of concern in biomethane injected into a common carrier pipeline. This legislation also required the Commission to adopt monitoring, testing, reporting, and recordkeeping protocols to ensure the safety and integrity of pipelines and pipeline facilities. Pursuant to AB 1900, this Commission, with the assistance of the California Air Resources Board (CARB) and the Office of Environmental Health Hazard Assessment (OEHHA), as well as parties to this rulemaking, adopted Decision (D.) 14-01-034, establishing standards for 17 constituents of concern[3] found in biomethane. One of the 17 constituents of concern is siloxane.

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[1] AB 1900, enacted into law in Chapter 602 of the Statutes of 2012.

[2] All subsequent section references are to the Public Utilities Code unless otherwise specified.

[3] CARB and OEHHA identified the following 12 constituents of concern that can potentially be present in biomethane: (1) antimony; (2) copper; (3) p-Dichlorobenzene; (4) ethylbenzene; (5) hydrogen sulfide; (6) lead; (7) methacrolein; (8) n-Nitroso-di-n-propylamine; (9) mercaptans; (10) toluene; (11) Vinyl chloride; and (12) arsenic. These twelve constituents were deemed to have environmental or human health impacts and maximum permissible concentrations were accounted for. The natural gas utilities identified, and the Commission adopted, the following five constituents which pose a risk of equipment damage and catalyst poising: (1) siloxanes; (2) ammonia; (3) hydrogen; (4) mercury; and (5) biologicals.

Siloxane[4] poses a "risk of equipment damage and catalyst poisoning."[5] Thus, D.14-01-034 adopted monitoring, testing, reporting, and recordkeeping requirements for the presence of siloxane in biomethane injected into the natural gas utilities' pipelines. Importantly, adherence to these standards and protocols ensures that human health, and the integrity and safety of the gas pipelines and pipeline facilities, are protected.

Following D.14-01-034, the Commission, in D.15-06-029, addressed cost issues associated with meeting the biomethane standards and requirements adopted in D.14-01-034. In D.15-06-029, the Commission also adopted a biomethane monetary incentive program designed to encourage biomethane producers to design, construct, and safely operate projects that interconnect and inject biomethane into California's natural gas utilities' pipeline systems. Pursuant to the requirements of AB 2313 (2016), the monetary incentive program was modified in D.16-12-043.

In 2016, the California Legislature addressed biomethane in Senate Bill (SB) 840.[6] Among the findings and declarations, the Legislature stated the following in Section 10 of SB 840:

> (d) Biomethane provides a sustainable and clean alternative to natural gas. If 10 percent of California's natural gas use were to be replaced with biomethane use, emissions of greenhouse gases would

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[4] According to the California Council on Science and Technology (CCST), "Siloxanes are manmade compounds, and there is no known biological process that forms them …. Siloxanes are used in the manufacture of personal hygiene, health care, and industrial products. As a consequence of their widespread use, siloxanes are found in wastewater and solid waste deposited in landfills." California Council on Science and Technology, *Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxanes Specifications* at 23.

[5] *Id.* at 23.

[6] SB 840, enacted into law in Chapter 341 of the Statutes of 2016.

be reduced by tens of millions of metric tons of carbon dioxide equivalent every year.

(e) Investing in biomethane would create co-benefits, including flexible generation of electricity from a renewable source that is available 24 hours a day, reduction of fossil fuel use, reduction of air and water pollution, and new jobs.

(f) Biomethane can also be used as transportation fuel or injected into natural gas pipelines for other uses. The most appropriate use of biomethane varies depending on the source, proximity to existing natural gas pipeline injection points or large vehicle fleets, and the circumstances of existing facilities.

(g) The biomethane market has been slow to develop in California because the collection, purification, and pipeline injection of biomethane can be costly.

(h) Biomethane is poised to play a key role in future natural gas and hydrogen fuel markets as a blendstock that can significantly reduce the carbon footprint of these two fossil-backed alternative fuels.

(i) Biomethane is one of the most promising alternative vehicle fuels because it generates the least net emissions of greenhouse gases. According to the low carbon fuel standard regulations (Subarticle 7 (commencing with Section 95480) of Article 4 of Subchapter 10 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations) adopted by the State Air Resources Board, vehicles running on biomethane generate significantly lower emissions of greenhouse gases than vehicles running on electricity or fossil fuel-derived hydrogen.

In one of the Legislature's findings and declarations with respect to the CCST, the following was stated:

(k) The [CCST] was uniquely established at the request of the Legislature for the specific purpose of offering expert advice to state

> government on public policy issues significantly related to science and technology.[7]
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> In Section 11 of SB 840, the Legislature added Section 784.1. It states:
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> (a) The Legislature requests that the [CCST] undertake and complete a study analyzing the regional and gas corporation specific issues relating to minimum heating value and maximum siloxane specification for biomethane before it can be injected into common carrier gas pipelines, including those specifications adopted in Sections 4.4.3.3 and 4.4.4 of commission Decision 14-01-034 (January 16, 2014), Decision Regarding the Biomethane Implementation Tasks in Assembly Bill 1900. The study shall consider and evaluate other states' standards, the source of biomethane, the dilution of biomethane after it is injected into the pipeline, the equipment and technology upgrades required to meet the minimum heating value specifications, including the impacts of those specifications on the cost, volume of biomethane sold, equipment operation, and safety. The study shall also consider whether different sources of biogas should have different standards or if all sources should adhere to one standard for the minimum heating value and maximum permissible level of siloxanes. The study shall develop the best science reasonably available and not merely be a literature review.

If the CCST agreed to undertake the study, within six months of its completion, the Commission was directed to: "reevaluate its requirements and standards adopted pursuant to Section 25421 of the Health and Safety Code relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made in the study by the [CCST]."

[7] SB 840, Section 10, Findings and Declarations.

A second bill addressing biomethane was adopted in 2016. AB 2313[8] changes the monetary incentive program adopted in D.15-06-029, and adds Sections 399.19 and 784.2. Section 399.19 extended the monetary incentive program to December 31, 2021, and increased the incentive amounts for non-dairy cluster biomethane projects to $3 million from $1.5 million, and for dairy cluster biomethane projects, an increase in the incentive amounts to $5 million from $1.5 million. The Commission implemented these changes in D.16-12-043.

Pursuant to SB 840 and D.16-12-043, the Commission contracted with CCST to conduct the study called for by Section 784.1. CCST completed its study and presented its findings, conclusions, and recommendations in a public workshop on June 11, 2018 held at the Commission's San Francisco headquarters. This decision reviews CCST's recommendations, the parties' positions on CCST's recommendations, and makes determinations on the issues addressed. Below, we discuss the issues, as identified in the assigned Commissioner's scoping memo.

2. Purpose of Proceeding

This proceeding remained open to re-evaluate the adopted requirements and standards that CCST examined in its study.

In June 2018, CCST published its study, *Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications* (CCST Study).

[8] AB 2313, enacted into law into Chapter 571 of the Statutes of 2016.

On July 5, 2018, the assigned Commissioner issued an amended scoping memo and ruling. The scoping memo and ruling set forth the category, issues to be addressed, and the schedule of the proceeding.

2.1. Issues

Parties filed comments on the issues identified in the Scoping Memo on July 27, 2018. As set forth in the Scoping Memo, the issues to be addressed are:

1. **Heating Value Specification Number**: whether the Commission should allow biomethane injection with a heating value as low as 970 British Thermal Units (BTU)/standard cubic feet (scf), provided the biomethane being injected satisfies the current Wobbe Number limits and all other requirements?

2. **Maximum Siloxane Concentrations for Biomethane:** whether, given that CCST reports there is insufficient evidence available to determine whether the Commission's maximum siloxane limit of 0.1 mg Si/m3 is too stringent or not stringent enough to meet safety requirements, this requirement should remain unchanged?

3. **Reduced Verification Requirements:** The CCST Study recommends considering a reduced and simplified verification regime to avoid unnecessarily encumbering sources that do not produce siloxanes. (Summary Report, at 12-13.) Should the Commission approve reduced and simplified verification requirements for biomethane from dairies, agricultural waste, and/or forestry residues? If so, what requirements should apply?

4. **Waiver Process for Blending in Certain Locations:** The CCST study concluded that blending of upgraded biogas with natural gas in or at the pipeline might allow safe pipeline movement of upgraded biogas that does not meet all specifications, but only under very specific conditions. (Summary Report, at 15.) Should there be a process for biomethane producers to request utility approval of a lower heating value standard at locations where specific conditions (volume of injection, location of injection,

location of end uses, volume throughput, customer usage, configuration of local pipeline system, etc.) ensure that adequate blending will occur by the time the gas arrives at end-use equipment? If so, what should that process consist of?

5. **Extension of Monetary Incentive Programs:** under Decision 16-12-043 and Assembly Bill 2313, the Commission was directed to: (1) extend the monetary incentive program to December 31, 2021; (2) for non-dairy cluster biomethane projects, increase the total available incentive limitation from $1.5 million to $3 million; (3) for a diary cluster biomethane project, the total available incentive limitation amount is $5 million; and (4) Section 399.19 is to "remain in effect only until January 1, 2022, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2022, deletes or extends that date."[9]

Parties that filed comments include: (1) the Bioenergy Association of California (BAC); (2) DTE Biomass Energy (DTE); (3) the Gas Technology Institute (GTI); (4) CR&R Incorporated (CR&R); (5) California Association of Sanitation Agencies (CASA); (6) Climate Resolve; (7) Clean Energy; (8) Agricultural Energy Consumers Association (AECA); (9) Maas Energy Works; (10) Hydrogenics USA, Inc.; (11) San Diego Gas & Electric Company (SDG&E), Southern California Gas Company (SoCalGas); (12) Southwest Gas Corporation; (13) Pacific Gas and Electric Company (PG&E); (14) Alaska Applied Sciences, Inc.; (15) East Bay Municipal Utility District (EBMUD); (16) Harvest Power, Inc.; (17) Giner ELX; (18) California Hydrogen Business Council; (19) Dairy Cares; (20) California Energy Exchange; (21) Central California Asthma Collaborative, Leadership Counsel for Justice and Accountability; (22) DVO, Inc.; (23) National

[9] This issue is not addressed in this Decision.

Fuel Cell Research Center; (24) AquaHydrex, Inc.; (25) Coalition for Renewable Natural Gas, Inc. (CRNG); (26) California Natural Gas Vehicle Coalition; (27) Bloom Energy; (28) Planet Hydrogen; (29) ITM Power Inc.; and (30) California Bioenergy. Several of the above parties as well as Public Advocates Office (Cal Advocates) also filed reply comments.

3. Definitions

At the threshold, it is useful to describe what the terms "biogas" and "biomethane" mean in the context of California's gas regime. The term "biogas" is defined in Health and Safety Code Section 25420 to mean "gas that is produced from the anaerobic decomposition of organic material," while the term "biomethane" is defined to mean "biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of [Health and Safety Code] Section 25421 for injection into a common carrier pipeline."

In D.14-01-034,[10] we commented further upon the definitions:

> Biogas can be processed or upgraded to increase the percentage of methane in the gas by removing CO_2 and other trace components. When biogas is upgraded to pipeline quality, it is referred to as biomethane. Conversion of biogas into biomethane typically requires water removal, CO_2 separation (using adsorption, absorption, membrane separation, or cryogenic distillation technology), and compression. During biogas upgrading, trace constituents are removed to levels comparable to or below those in traditional pipeline natural gas.

Further, in D.14-01-034, we determined that biomethane offers several benefits including: (1) supporting energy diversity as a renewable energy source;

[10] D.14-01-034 at 10.

(2) reducing greenhouse gas emissions; (3) promoting sustainable waste management practices, and (4) the creation of new jobs through the production and use of biomethane.[11] We now turn to the discussion of CCST's conclusions and recommendations.

4. Discussion

4.1. Heating Value Specification Number

4.1.1. CCST Study: Heating Value and Wobbe Number

The heating value (HV) of biomethane is regulated to ensure that gas used by consumers provides the appropriate energy content and heat required by commonly-used equipment. Specifically, the Wobbe Number represents the rate of energy delivered through a fixed orifice at a constant pressure, and is calculated by dividing the higher heating value of the gas by the square foot of the specific gravity of the gas.[12] Together, the heating value and Wobbe Number are commonly used measures of gas quality.[13] Meeting the Wobbe Number limits is a critical safety requirement to ensure that different utility gas supplies are interchangeable, and that combustion is consistent and will not cause equipment or appliance performance problems that could pose a safety concern for utility end user customers.

Biomethane typically has a lower heating value than natural gas.[14] Maintaining the heating value in a gas supply is important for product quality,

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[11] D.14-01-034 at 12.

[12] CCST Study at 16.

[13] CCST Study at 17.

[14] *Id.*

consumer safety and expectations, and for the safe transport and combustion of gas. California's gas distribution system serves millions of end-users each day on a wide range of devices that vary from small-scale devices such as natural gas barbeque grills to large-scale industrial equipment used continuously, such as oil refineries.

In D.06-09-039 and D.14-01-034, we first determined, and then upheld, the current heating value requirement for biomethane injection at 990 BTU per scf for SoCalGas and SDG&E.[15] Pursuant to SB 840, we re-evaluate the current heating value requirement in light of CCST's findings and conclusions. CCST's study concludes that keeping the current minimum Wobbe Number and relaxing the HV specification to a level near 970 BTU is unlikely to impact safety or equipment reliability and recommends that we retain the minimum Wobbe Number requirements as they are now and re-examine regulations on the heating value minimum levels. It directs us to initiate a regulatory proceeding to examine the option of allowing biomethane satisfying the current Wobbe Number requirements and all other requirements but with a heating value as low as 970 BTU/scf.[16]

CCST states that the evidence does not support further reduction of the minimum HV to 950 BTU/scf without further research because safety for end user utility customers could be compromised and there have been few interchangeability studies at this low level for appliances tuned to historical gas

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[15] D.14-01-034 did not adopt a minimum heating value standard for PG&E or Southwest Gas because their process sets a specific heating value standard for each injection location. (D.14-01-034, at 92). For PG&E we stated: "The gas shall have a heating value that is consistent with the standards established by PG&E for each Receipt Point." (D.14-01-034 at 88-89).

[16] CCST Study at 41.

supplies in California.[17] In the scoping memo, we asked whether the Commission should allow biomethane injection with a heating value as low as 970 BTU/scf, provided the biomethane being injected satisfies the current Wobbe Number limits and all other requirements.

4.2. Positions of Parties

In their comments and reply comments, parties responded to CCST's recommendation to lower the heating value and maintain the existing Wobbe Number requirements.

The Central California Asthma Collaborative (CCAC) and the Leadership Counsel for Justice and Accountability (Leadership Counsel) state the Commission should fully address public health and local impacts of biomethane production, whether in this proceeding, a new track of this proceeding, or a separate proceeding.[18] At a minimum, they argue, the Commission should ensure coordination with other state and local agencies to determine whether there is "buy-in" of projects at the local community level, especially disadvantaged communities that live in close proximity to biomethane developers, such as dairies.[19] CCAC and Leadership Counsel claim that a broad array of public health concerns are unaddressed within this proceeding.[20] They assert that this proceeding must consider the health and safety risks associated

[17] CCST Study at 41.

[18] Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[19] *Id.*

[20] *Id.* at 5.

with biomethane production as required by Section 451.[21] They assert that the proceeding must consider safety issues presented by the entire lifecycle of biomethane production, in particular, risks of accidental releases of hazardous or toxic chemicals including byproducts of both recovery and condition processes for this energy resource.[22] They also recommend the Commission examine the relative increases in energy demand that could result from varying heat coefficients and methods to sustainably meet those needs.

The biomethane proponents strongly support reducing the heating value of pipeline biogas to as low as 970 BTU. BAC contends that lowering the heating value will "reduce individual project costs by $1 million or more as it would in many cases reduce the need for secondary biomethane purification."[23] Likewise, DTE supports further reducing the heating value in California between 950 BTU and 970 BTU.[24] DTE stated it encourages the Commission to consider "heating values below [970 BTU.]"[25] GTI argues that reducing the heating value of pipeline biogas to as low as 970 BTU should be done in consultation with California's natural gas utilities.[26] Climate Resolve stated that reducing the heating value to as low as 970 BTU will "help reduce short-lived climate pollutants and improve air quality."[27] Additionally, Clean Energy advocated for

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[21] *Id.*

[22] *Id.*

[23] BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling at 7.

[24] DTE Biomass Energy on the Assigned Commissioner's Scoping Memo and Ruling at 3-4.

[25] *Id.*

[26] GTI on the Assigned Commissioner's Scoping Memo and Ruling at 6.

[27] Climate Resolve on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

reducing the heating value of pipeline biogas to 950 BTU or a range of 950 to 970 BTU.[28] Clean Energy argued that such a range would reduce project developer costs by $1 million or more and cites that a number of pipelines across the country have a minimum heating content specification of 950 BTU.[29] Maas Energy Works supports lowering the BTU/scf minimum to 970.[30] Harvest Power, Inc. supports reducing the heating value to 970 BTU/scf as this will "ensure that a wider range of biomethane projects are built in California" and will "avoid the costly process of blending biomethane with natural gas prior to injection into the natural gas grid."[31] CRNG believes that there is "sufficient precedent to substantiate, if not warrant, a reasonable minimum heating value requirement between 950 and 970 BTU/scf."[32] Bloom Energy asserted that it supports the allowance of biomethane injection into a California pipeline at a heating value of 970 BTU/scf as long as the biomethane meets all other requirements.[33]

SDG&E and SoCalGas jointly stated that, based on its recent interchangeability study, its Rule 30 heating value limit could be reduced to 970 BTU/scf for all supplies, not just biomethane injection, so long as all other Rule 30 requirements are met. They jointly state that SoCalGas found that the

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[28] Clean Energy on the Assigned Commissioner's Scoping Memo and Ruling at 9.

[29] *Id.*

[30] Maas Energy Works on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[31] Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 2.

[32] CRNG on the Assigned Commissioner's Scoping Memo and Ruling at 3-5.

[33] Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling at 4.

lower heating value is not an issue as long as the Wobbe Number is within the 1279 to 1385 range and total inerts remain below 4 percent.[34]

Southwest Gas stated that the heating value could be as low as 970 BTU/scf provided that the gas supply meets all other existing gas quality requirements, including the Wobbe Number.[35]

PG&E agrees with CCST's recommendation of a minimum heating value as low as 970 BTU/scf provided that "(a) the gas supply meets the Wobbe Index guidelines established and used by PG&E for certain geographic areas on the pipeline system, and (b) all other existing gas quality requirements are maintained."[36] PG&E concluded that while it agrees a 970 BTU/scf minimum heating value is acceptable, it must be in conjunction with meeting the Wobbe Number guidelines for safe combustion.[37] Additionally, PG&E states it does not have a heating value or BTU/scf and maximum value specified in its tariff, as is the case with some of the other utilities, since the BTU/scf of PG&E's supply sources vary considerably depending on where the gas is produced and received into the system.[38] Thus, PG&E states that a lower BTU/scf number in PG&E's tariff may actually preclude the acceptance of gas from certain sources, as well as native well production.

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas stated they do not support lowering the minimum heating value to 950 BTU/scf

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[34] SoCalGas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[35] Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[36] PG&E on the Assigned Commissioner's Scoping Memo and Ruling at 2.

[37] *Id.*

without further study and collaboration with stakeholders to ensure critical safety requirements are met.[39] They contend that heating value at 950 BTU/scf: (1) increases the potential for appliance performance issues, including safety issues such as outages and carbon monoxide formation; (2) increases the potential for undercooked food for customers that rely on preset cooking times; and (3) increases the potential of exceeding the utilities' inerts limits, carbon dioxide limits, and interchangeability requirements.[40]

Cal Advocates submitted reply comments supporting a minimum heating value of 970 BTU/scf. Cal Advocates argues that 970 BTU/scf represents an economically feasible heating value standard that would not serve as a barrier to the development of biomethane projects. Furthermore, Cal Advocates asserts that the CCST Report provides evidence that lowering the heating value to 970 BTU/scf from 990 BTU/scf would "unlikely impact the safety of end-use equipment, provided all other gas quality specifications, including the Wobbe number, are satisfied."[41] Cal Advocates also agreed with findings of the CCST Report that a 950 BTU/scf standard could present challenges and adverse interactions with current appliances and equipment in California, trigger corrosion-related safety issues, and create the potential for timed cooking equipment to lead to undercooked food if unadjusted.[42] EBMUD "strongly

[39] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments at 2.

[40] *Id.*

[41] Cal Advocates on the Assigned Commissioner's Scoping Memo and Ruling at 1.

[42] *Id.* at 1-2.

supports" reducing the heating value of pipeline biogas to as low as 970 BTU/scf.[43]

4.3. Determination

Before discussing the recommendations of CCST and the arguments presented by the parties, we must keep in mind that Health and Safety Code Section 25421(c) provides that the Commission is responsible for protecting human health and protecting the integrity and safety of California's natural gas pipeline and pipeline facilities. In keeping with the requirements of Health and Safety Code Section 25421, we consider the recommendations of CCST, pursuant to Section 784.1 and the parties' arguments pertaining to lowering the heating value.

California's current minimum heating value requirement is 990 BTU/scf. In D.14-01-034, we upheld the prior determination in D.06-09-039 to set the minimum heating value in California at 990 BTU/scf. We affirmed the 990 BTU/scf minimum heating value in D.14-01-034 because there was a lack of science available at the time to support lowering the heating value and biomethane proponents did not present sufficient evidence to show a how a lower heating value would not adversely affect California's gas distribution systems and consequently, not harm the end user utility customers.[44] Today, however, CCST has presented scientific evidence to support adjusting the minimum heating value to 970 BTU/scf from 990 BTU/scf, as discussed here.

[43] EBMUD on the Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 4.

[44] D.14-01-034 at 102-109.

Outside of CCAC and Leadership Counsel, there is strong support for lowering the minimum heating value to 970 BTU/scf from 990 BTU/scf. However, some parties such as Clean Energy, DTE, and the Coalition for Renewable Gas, support an even lower 950 BTU/scf heating value or a band of 950 BTU/scf to 970 BTU/scf heating value.

We are not persuaded by the arguments presented in favor of a 950 BTU/scf heating value or a lower heating value band between 950 and 970 BTU/scf. The scientific evidence presented by CCST does not support that range as an acceptable band to control natural gas characteristics that can be consumed by end users while maintaining safety, reliability, and environmental performance. Due to the lack of empirical interchangeability studies at a 950 BTU/scf heating value level, there is uncertainty regarding impacts, including corrosion-related safety issues if maximum carbon dioxide specifications are loosened to accommodate gas with a lower heating value, interaction with the existing California appliance and equipment base, and ability to adequately adjust timed cooking equipment to prevent undercooked food.

Parties in favor of a 950 BTU/scf or a band between 950-970 BTU/scf have not introduced any scientific evidence to demonstrate that lowering the heating value to these levels will not cause end use equipment problems. Instead, they only rely on the argument that other states allow biomethane to have a minimum heating value of 950 BTU/scf, or close to that number, and so California should likewise lower its minimum heating value. As the joint utilities put it, "[b]oth [Coalition for Renewable Natural Gas] and DTE cite to minimum heating value limits in other states as justification that California should follow suit. However, both ignore the difference in the gas make-up and historical uses in the various

states. While a certain gas specification may be appropriate in one state, it may not be appropriate for another."[45] We agree with CCST, Cal Advocates, and the joint utilities and find the argument for a 950 BTU/scf minimum heating value unpersuasive. Relying on other states' requirements with no scientific evidence to support such a change in California is not a sufficient justification to lower the heating value when such a change could adversely affect the integrity and safety of California end use equipment to utility customers.

We are persuaded to lower the heating value to 970 BTU/scf from 990 BTU/scf as long as current Wobbe Number requirements are satisfied and all other requirements of utility gas tariffs are met.

We are persuaded by CCST's conclusion that available evidence suggests that a reduction of the minimum heating value specification to 970 BTU/scf would be acceptable from both safety and equipment durability perspectives.[46] The CCST Study notes that current scientific literature provides several empirical examples in which appliances exhibit no safety or operational issues when switching from baseline gases (with higher heating value and Wobbe characteristics) to a fuel with a heating value of approximately 970 BTU/scf as long as Wobbe Number requirements and all other requirements of utility gas quality tariffs are met.[47]

Based on the scientific evidence presented, lowering the heating value to 970 BTU/scf from 990 BTU/scf while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas tariffs will not

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[45] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 2-3.

[46] CCST Study at 40.

[47] CCST Study at 41.

contravene the Commission's safety mandates codified in Health and Safety Code Section 25421(c). We adopt CCST's recommendation and lower the minimum heating value standard to 970 BTU/scf. At this time, we make this change only for SoCalGas and SDG&E's tariffs. Therefore, we allow SDG&E and SoCalGas to lower their heating value to 970 BTU/scf from 990 BTU/scf while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas for biomethane provided that a 970 heating value does not create any safety risks for end-user utility customers or compromise the gas pipeline system. PG&E and Southwest Gas are not subject to the minimum heating value standard adopted in our prior decisions because their tariffs provide for a specific heating value established by the utility for each location.

4.4. Maximum Siloxane Concentration

4.4.1. CCST Study: Maximum Siloxane Concentrations for Common-Carrier Pipelines

Pursuant to Health and Safety Code Section 25421, in D.14-01-034, we adopted a permissible concentration of siloxane, a constituent of concern, because of the potential that deposition of siloxane on equipment could adversely impact the operation of equipment. As part of its mandate under Section 784.1, CCST evaluated California's maximum siloxane standard, as adopted in D.14-01-034. CCST determined there is not enough evidence available to conclude whether 0.1 milligram (mg) silicon/cubic meter (Si/m3) is too stringent or not stringent enough to meet safety requirements and therefore, recommended to retain California's existing standard.[48] After publication of new

[48] CCST Study at 56.

research regarding siloxanes, the CCST Study team re-evaluated the evidence and re-affirmed its recommendation to maintain the existing siloxane standard.[49] In the Scoping Memo, we asked whether, given CCST's conclusions that there is insufficient evidence available to determine whether California's siloxane limit is too stringent or not stringent enough, should the requirement remain unchanged.

4.5. Position of Parties

In their comments and reply comments, parties addressed CCST's recommendation to maintain the existing maximum siloxane concentration standard.

Several parties support further siloxane research. EBMUD,[50] CR&R,[51] GTI,[52] and California Bioenergy[53] support CCST's recommendation to conduct additional research to determine whether the current siloxane standard is appropriate. CASA supports CCST's recommendation to conduct additional research to determine whether the siloxane standard is appropriate and suggests that research include an examination of wastewater treatment.[54] Climate Resolve stated that additional research is needed to determine whether the siloxane

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[49] CCST Facilitated Expert Opinion -- The Updated State of Science Regarding Maximum Permissible Siloxane Concentration, dated October 30, 2018. This document was placed into the record of this proceeding as Appendix C to the November 19, 2018 Assigned Commissioner Ruling Seeking Comment.

[50] EBMUD on the Assigned Commissioner's Scoping Memo and Ruling at 4.

[51] CR&R on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[52] GTI on the Assigned Commissioner's Scoping Memo and Ruling at 6-7.

[53] California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling, at 3.

[54] CASA on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 6.

standard is sufficiently or over-protective.[55] Bloom Energy asserts that the maximum siloxane concentration for biomethane should remain unchanged.[56]

Some parties assert the current siloxane standards are too high. DTE states that the current siloxane limit of .1mg Si/m3 is "far too stringent for biomethane operations in California" and siloxane "does not pose a problem for human health and safety, as it is found in a variety of household products such as shampoo and deodorants."[57] DTE strongly supports the "need to reduce verification and reporting requirements for source biomethane that is unlikely to include siloxanes."[58] Additionally, Clean Energy stated it is supportive of CCST's recommendation to conduct additional research to develop an appropriate siloxane standard but "this should not prevent the Commission from reexamining the need to relax the current siloxane standard as it creates a substantial barrier to starting up many in-state biomethane projects."[59] Harvest Power asserts that the maximum siloxane limit of .1 Si/m3 is far too stringent for biomethane projects and should be "substantially increased."[60] The CRNG recommends that that the Commission allow biomethane to be injected with a provisional siloxane standard of 1 part per million, provided certain conditions such as volume of injection, location of injection, location of end uses, volume

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[55] Climate Resolve on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[56] Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

[57] DTE Biomass Energy on the Assigned Commissioner's Scoping Memo and Ruling at 4-5.

[58] *Id.*

[59] Clean Energy on the Assigned Commissioner's Scoping Memo and Ruling at 9 and 10.

[60] Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling at 2.

throughput, customer usage, configuration of the pipeline ensure that adequate blending occur by the time the processed gas arrives at end-use equipment.[61]

CCAC and Leadership Counsel advocate for the Commission to prioritize worker, public health, and safety when considering the use of varying quantities of siloxane. It is concerned that increasing amounts of silica forming in burner vents and filters could cause facility failure and even an explosive pressure event.[62]

California's utilities also concurred with CCST's recommendation to maintain the existing maximum siloxane concentration standard. SDG&E and SoCalGas jointly stated that it agrees with maintaining the siloxane limit of .1 mg Si/m3 until additional studies provide evidence to support a different limit.[63] Furthermore, in their comments, they reference their own studies which purport to show siloxane limits of .1 Si/m3 as an appropriate limit to protect end user equipment.[64]

Southwest Gas stated it agrees with CCST's conclusion that there is insufficient evidence to determine whether the current siloxane standard should be changed.[65]

PG&E agrees with CCST's recommendation that there is insufficient information available to determine whether the current siloxane standard should

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[61] CRNG on the Assigned Commissioner's Scoping Memo and Ruling at 5-8.

[62] Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability on the Assigned Commissioner's Scoping Memo and Ruling.

[63] SoCal Gas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[64] *Id.*

[65] Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling at 3.

be changed.[66] PG&E recommends, as a safety precaution, that the current siloxane standard remain unchanged until sufficient studies can be performed to understand the physical impact of the combustion of siloxanes on customer end-use equipment.[67]

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas stated while some parties requested that the current limits on siloxanes should be increased, no party provided scientific evidence to justify increasing siloxane limits.[68] The joint utilities took issue with some parties' argument that siloxanes do not pose a risk to human health.[69] The joint utilities argue this is an incorrect interpretation of CCST's report which acknowledges that "post-combustion, the siloxanes form silica and agglomerate to form silica nanoparticles, which could potentially have detrimental health impacts" and "deposition of silica on equipment can cause a wide variety of operational issues and hazards. Possible direct health impacts are not well known and need more study."[70]

Cal Advocates recommends that the current maximum siloxane requirement should remain unchanged until there is sufficient evidence to determine whether the limit is too stringent or not stringent enough and supported additional research to extrapolate upon the issue.[71] Cal Advocates took issue with some parties' arguments that the lack of evidence to retain the

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[66] PG&E on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[67] *Id.*

[68] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Commentsat 5-6.

[69] *Id.*

[70] *Id.*

[71] Cal Advocates on the Assigned Commissioner's Scoping Memo and Ruling at 1.

current standard supported relaxing or removing it all together. Cal Advocates rebutted, arguing that if "anything, the lack of conclusive evidence about whether the current standard is too stringent or not stringent enough supports being conservative in the interest of protecting safety."[72]

4.6. Determination

Health and Safety Code § 25421 requires the Commission to protect human health, and the integrity and safety of the pipeline and pipeline facilities. § 784.1 requires the Commission to reevaluate its requirements pursuant to Health and Safety Code § 25421 and if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations in the study by CCST.

CCST states there is not enough information available to determine whether 0.1mg Si/m3 is too stringent or not stringent enough to meet safety requirements.[73] As a result, CCST concludes there is not enough evidence to recommend any change to the maximum allowable siloxane concentration.[74] Even after reviewing newly published research, the CCST Study team affirmed its recommendation to maintain the current siloxane standard. CCST recommends a comprehensive research program to understand the operational, health, and safety consequences of various concentrations of siloxanes, together with monitoring of the American Society for Testing and Materials International

[72] *Id.* at 1-2.

[73] CCST Study, at 56.

[74] CCST Study at 56.

(ASTM International) process to adopt and test a standard method for measurement of siloxanes.[75]

We are not persuaded by arguments that because CCST found insufficient evidence to determine whether the maximum siloxane limit of .1mg Si/m3 is appropriate, the .1 mg Si/m3 should be eliminated or modified. Such parties have not offered sufficient scientific or other evidence in this proceeding to demonstrate that relaxing the siloxane standard will not cause equipment or end-user problems. To be sure, CRNG argues that the fact that there is insufficient evidence available to determine whether the Commission's maximum siloxane limit of .1mg Si/m3 is too stringent or not stringent enough to meet safety requirements is "evidence in and of itself that such a standard is ancillary" and that if "siloxanes were an issue," then "studies would have been commissioned, reports published and data available after nearly 40 years of biomethane injection into common carrier pipelines across the United States." We disagree.

As Health and Safety Code § 25421(c) clearly states, the standards for siloxane - and its peer constituents of concern — are those that are reasonably necessary to ensure the protection of human health and for the integrity and safety of the pipeline and pipeline facilities. We believe it is prudent to maintain the current siloxane limit until there is compelling evidence to justify a change.

We find it appropriate to defer to the recommendation in the CCST Study and we decline to make any changes to the current maximum siloxane limit of .1 mg Si/m3 at this time.

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[75] CCST Study at 43-44.

4.7. Reduced Verification Requirements for Sources Unlikely to Contain Siloxane

Section 784.1 directed that the CCST study should "also consider whether different sources of biogas should have different standards or if all sources should adhere to one standard for the minimum heating value and maximum permissible levels of siloxanes." In D.14-01-034, the Commission, finding that siloxane could "pose a risk of equipment damage and catalyst poisoning," established a "trigger level" of 0.01 mg Si/m3 and a "lower action level" standard for siloxane in biomethane injected into pipelines of 0.1 mg Si/m3.[76]

Siloxanes are used in personal hygiene, health care and industrial products. As a result they are found in wastewater and solid waste deposited in landfills.[77] CCST noted: "Siloxanes are manmade compounds, and there is no biological process that forms them…"[78] They "are regulated because they affect the expected lifetime of combustion equipment through deposition of silica."[79]

The Commission issued a Scoping Memo and Ruling dated July 5, 2018 that sought party comments on the CCST Study, including the recommendation regarding siloxane verification. The Scoping Memo asked the parties to comment on whether the Commission should approve a reduced and simplified verification requirement for biomethane from dairies, agricultural waste and/or forest residues and, if so, what requirements should apply.

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[76] CCST Study at 20-21.

[77] CCST Study, at 23.

[78] *Id.*

[79] *Id.* at 13.

4.7.1. Position of Parties

In their comments and reply comments, parties stated their positions on whether to reduce verification requirements for sources unlikely to contain siloxanes.

Bloom Energy,[80] California Bioenergy,[81] CR&R,[82] CASA,[83] Maas Energy Works,[84] CRNG,[85] DVO Inc.,[86] AECA,[87] Dairy Cares,[88] Harvest Power,[89] Clean Energy,[90] Climate Resolve, BAC,[91] DTE, and GTI[92] supported reduced monitoring and verification requirements for siloxanes from biogas sources other than landfill and wastewater treatment facilities.

The Central California Asthma Collaborative and Leadership Counsel state they are concerned with increased amounts of silica forming in burner vents and filters that could cause facility failure and even, an explosive event.[93]

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[80] Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

[81] California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling at 4.

[82] CR&R on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[83] CASA on the Assigned Commissioner's Scoping Memo and Ruling at 6.

[84] Mass Energy Works on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[85] CRNGas on the Assigned Commissioner's Scoping Memo and Ruling at 8.

[86] DVO Comments on the Assigned Commissioner's Scoping Memo and Ruling at 2.

[87] AECA on the Assigned Commissioner's Scoping Memo and Ruling at 2.

[88] Dairy Cares on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[89] Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[90] Clean Energy on the Assigned Commissioner's Scoping Memo and Ruling.

[91] BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 7.

[92] GTI on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 7.

[93] Central California Asthma Collaborative and Leadership Counsel for Justice and Accountability on the Assigned Commissioner's Scoping Memo and Ruling, July 26, 2018 at 5.

In their opening comments, SDG&E and SoCalGas jointly stated that siloxanes are "not likely to be present in dairies, agricultural waste, and/or forestry residues." However, they state that there is potential that certain chemicals may be introduced in the operations of dairies, agricultural waste, and/or forestry residues that may make it into the biogas (*e.g.,* facility operations, products used during digestion process, lubricants for equipment operation, etc.)."[94] SDG&E and SoCalGas stated "[w]ithout knowing the detailed operations of the producer, SoCalGas and SDG&E believe it is prudent to verify that siloxanes are not present in each project before eliminating it from periodic testing required by D.14-01-034."[95]

Southwest Gas believes that reduced or simplified verification requirements can be utilized, as siloxanes are not likely to be present in dairies, agricultural waste, and/or forestry residues.[96] Southwest Gas contends that because of the potential for certain chemicals, such as siloxanes, to be introduced into the gas system as a result of the facility's operations, it is prudent to verify that siloxanes are not present for a project before eliminating the periodic testing requirement.[97] Thus, Southwest Gas recommended that: (1) if the raw biogas does not contain siloxanes, the periodic testing requirement for siloxanes can be eliminated for that project and (2) periodic testing of the raw biogas for siloxanes be permitted to ensure the raw biogas characteristics have not changed.[98]

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[94] SoCal Gas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling at 4.

[95] *Id.*

[96] Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling at 4.

[97] *Id.*

[98] *Id.*

PG&E stated it agreed with Recommendation 5 of Appendix O in the CCST study that certain testing requirements as described in PG&E's Gas Rule 21 could be reduced for biogas sources for which there is zero possibility of the presence of a constituent described in Gas Rule 21.[99] PG&E stated that if there is any possibility that a constituent of concern may be present in a biogas stream, quality testing should be performed before injection of biomethane into the pipeline.[100] PG&E contends that if, at the conclusion of the testing, such constituents are not found in the biogas stream, future testing can be stopped or minimized so long as the source of biogas remains unchanged.[101] PG&E stated that dairy biogas should continue to be tested for all constituents noted in its Gas Rule 21 but agricultural biomass waste and forestry waste may not need to be tested for siloxane on an on-going basis as this constituent is not present in the natural state for these types of waste.[102]

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas discussed the nuance of siloxane presence in unlikely sources. They explain:

> Experience has shown that siloxanes can be found in gas streams from sources that are assumed to not have siloxanes. Siloxanes can be a result of dairy operations or be introduced into biogas from equipment lubricants or co-digestion with organic materials that may include cosmetics, pharmaceuticals, or antifoaming agents. For example, PG&E gas quality tests performed in 2008 at its Vintage Dairy biomethane injection project found that siloxanes were present in dairy gas. While the siloxane levels

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[99] PG&E on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

[100] *Id.*

[101] *Id.*

[102] *Id.*

> were below reportable limits, it is evidence that siloxanes can exist in sources thought to not have siloxanes.[103]

Additionally, SoCalGas, SDG&E, PG&E, and Southwest Gas disagreed with DTE's argument that requiring testing of siloxanes "is an undue burden that prevents the economic development of these projects."[104] The utilities jointly counter:

> The Joint Utilities are informed that the cost of testing siloxanes ranges from $200 to $400 per test. This is not an economic burden that would prevent the development of biomethane projects. This is especially true if parties' comments are correct that their projects do not have siloxanes. If so, a biomethane developer's one-time testing cost of $200 to $400 is negligible.[105]

In its reply comments Cal Advocates supported consideration of reduced and simplified verification process for siloxane for biomethane from sources such as dairies, agricultural waste, and forestry. Cal Advocates argues that initial testing requirements for siloxane for biomethane from any source should be maintained and that once the test is passed, then "the periodic testing requirements may be reduced."[106]

The California Natural Gas Vehicle Coalition stated that lowering reporting requirements for biomethane sources that do not contain siloxanes is

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[103] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Commentsat 8.

[104] *Id.* at 8.

[105] *Id.*

[106] Cal Advocates on the Assigned Commissioner's Scoping Memo and Ruling at 3.

"logical to avoid redundancy and unwarranted regulatory burdens that hinder further commercial adoption of RNG."[107]

4.7.2. Determination

As we have previously stated, we must keep in mind that Health and Safety Code § 25421(c) provides that the Commission is responsible for protecting human health and protecting the integrity and safety of California's natural gas pipeline and pipeline facilities. Section 451 requires us to ensure that every public utility furnishes and maintains such adequate, efficient, just and reasonable service, instrumentalities, equipment, and facilities…as are necessary to promote the safety, health, comfort and convenience of its patrons, employees, and the public.

Additionally, pursuant to Health and Safety Code Section 25421, in D.14-01-034, we adopted a standard specifying the permissible concentration of siloxane, a constituent of concern, because of the potential that deposition of siloxane on equipment could adversely impact the operation of equipment. Indeed, it is inappropriate and contrary for us to maintain the current siloxane standard, yet carve out an exception to a basic rule to allow for the reduction of the siloxane testing requirements without more evidence and facts on silica's impact on end-user appliances and the natural gas pipeline distribution system – especially when siloxanes have been found present where they were assumed not to be.[108]

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[107] The California Natural Gas Vehicle Coalition on the Assigned Commissioner's Scoping Memo and Ruling.

[108] PG&E Opening Comments on Assigned Commissioner's Scoping Memo and Ruling, July 27, 2018 at 5.

We agree with the Central California Asthma Collaborative and Leadership Counsel that reduced siloxane testing requirements run contrary to our statutory responsibility under Section 451 and Health and Safety Code Section 25421(c).

Furthermore, we find that the experience discussed in the record by the Joint Utilities furthers the point and confirms concerns raised by the Central California Asthma Collaborative and Leadership Counsel that siloxanes can be found in gas streams from sources that are assumed to not have siloxanes.[109] The Joint Utilities contend that siloxanes can be a result of dairy operations or be introduced into biogas from equipment lubricants or co-digestion with organic materials that may include cosmetics, pharmaceuticals, or antifoaming agents. As noted above, PG&E stated that its gas quality tests performed in 2008 at its Vintage Dairy biomethane injection project found that siloxanes were present in dairy gas.[110] We cannot ignore these facts, especially when we decline to change the existing siloxane standards. Therefore, we decline to adopt a reduced verification siloxane regime.

4.8. Waiver Process for Blending in Certain Locations (Heating Value Exception)

4.8.1. CCST Study Summary: Heating Value Exception

Section 784.1 directs that the CCST Study of biomethane heating value and siloxane specifications also consider and evaluate "the dilution of biomethane after it is injected into the pipeline … ." The CCST study found multiple issues

[109] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments, August 31, 2018 at 8.

[110] *Id.*

with pipeline blending. CCST states that pipeline blending is only effective when there is a consistent, unidirectional flow of natural gas at the point of biomethane addition.[111] This flow of natural gas also must be large enough, relative to the amount of biomethane, that the mixture will remain in compliance with gas quality specifications.[112] CCST also states that mixing may significantly restrict the flow from the biomethane producer during times when there is insufficient customer demand to allow for adequate mixing.[113] CCST asserts that there is a common misconception that the deviation in gas quality is negligible as biomethane will be a small volumetric contribution to the total supply.[114] CCST argues that this presumption ignores the fact that any observed effects of biomethane addition to the pipeline will be highly localized near the point of addition.[115] CCST further states that passive mixing may not occur reliably in practice, due to transient or discontinuous injection, causing "slugs" of out-of-specification gas to arrive erratically at end consumers.[116]

The Scoping Memo asked the parties to answer whether there should be a process for biomethane producers to request utility approval of a lower heating value standard at locations where specific conditions (volume of injection, location of injection, location of end uses, volume throughput, customer usage, configuration of local pipeline system, etc.) ensure that adequate blending will

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111 CCST Study at 83-35.

112 *Id.*

113 *Id.*

114 *Id.*

115 *Id.*

116 *Id.*

occur by the time the gas arrives at end-use equipment. The Scoping Memo also asked parties to discuss what that process should consist of.

4.8.2. Position of Parties

In their comments and reply comments, parties stated their positions regarding a waiver process for blending in certain locations.

California Bioenergy,[117] Clean Energy,[118] GTI,[119] CASA,[120] CR&R,[121] and BAC,[122] DTE,[123] Harvest Power,[124] CRNG,[125] Bloom Energy,[126] support a waiver process for blending in certain locations – tantamount to a heating value exception.

In their opening comments, SDG&E and SoCalGas support CCST's recommendation to have a process for biomethane producers to request utility approval of a lower heating value (e.g., under 970 BTU/scf) on a case-by-case basis, but their support is "contingent on the lower heating value gas otherwise meeting all of the other SoCalGas Rule 30 and SDG&E's Rule 30 gas quality specifications when delivered."[127] SDG&E and SoCalGas stated they currently

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[117] California Bioenergy on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[118] Clean Energy on the Assigned Commissioner's Scoping Memo and Ruling at 10.

[119] GTI on the Assigned Commissioner's Scoping Memo and Ruling at 7.

[120] CASA on the Assigned Commissioner's Scoping Memo and Ruling at 6-7.

[121] CR&R on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

[122] BAC Comments on the Assigned Commissioner's Scoping Memo and Ruling at 7.

[123] DTE Biomass Energy on the Assigned Commissioner's Scoping Memo and Ruling at 5-6.

[124] Harvest Power on the Assigned Commissioner's Scoping Memo and Ruling at 3.

[125] CRNG on the Assigned Commissioner's Scoping Memo and Ruling at 9.

[126] Bloom Energy on the Assigned Commissioner's Scoping Memo and Ruling at 5.

[127] SoCal Gas and SDG&E on the Assigned Commissioner's Scoping Memo and Ruling at 5.

have a deviation process to allow injection of non-compliant gas which requires an advice letter.[128]

Southwest Gas supports a process where, on a case-by-case and location specific basis, utilities can approve a lower heating value standard and should be "contingent upon the evaluation of various factors, to determine whether a gas stream can be blended into the pipeline system to meet all gas quality specifications for delivery."[129]

PG&E is supportive of a case-by-case location-specific waiver process done in a fair, consistent, transparent, and non-preferential manner where in the utility determines whether a biogas stream with lower than 970 BTU/scf can be accepted for delivery into the pipeline system.[130] PG&E contends that the waiver process must take into account daily location-specific operational conditions before an exception is granted, such as: (1) the interchangeability of the gas at the receipt point; (2) proximity of the gas supply to PG&E customers; (3) changing customer demand profiles; (4) and the historical BTU level received by PG&E's downstream customers.[131]

Jointly in reply comments, SoCalGas, SDG&E, PG&E, and Southwest Gas extrapolated further on this topic. They explain that downstream blending (or blending in the pipeline) is difficult to monitor, and could be nearly impossible to maintain because blending cannot be guaranteed to occur continuously.[132] They

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[128] *Id.*

[129] Southwest Gas on the Assigned Commissioner's Scoping Memo and Ruling at 4.

[130] PG&E on the Assigned Commissioner's Scoping Memo and Ruling at 6-7.

[131] *Id.*

[132] SoCalGas, SDG&E, PG&E, and Southwest Gas Reply Comments at 9-10.

state that changes made to the pipeline system to accommodate customer growth may also alter the blending of non-compliant gas supplies.[133] Additionally, they argue that changes in the location and magnitude of customer demand on the transmission or distribution system can and does change the direction of flow in the utilities' pipelines, which in turn adversely impacts the ability to sufficiently blend gas supplies before delivery to end-use customers.[134] SoCalGas' asserts that, based on its experience, customers have experienced safety incidents such as flame outages when its Rule 30 limits were not met.[135]

In its reply comments, Cal Advocates does not oppose the development of a waiver process for blending at certain locations with traditional natural gas within pipelines on a case-by-case basis, provided the "biomethane meets all other gas quality specifications besides [heating value] and there will be no safety consequences if the target [heating value] is not reached."[136]

4.9. Determination

Pursuant to Health and Safety Code Section 25421, in D.14-01-034, we adopted standards to ensure that only biomethane that is capable of meeting all gas quality requirements enters into the utilities gas pipeline systems. We decline to deviate from those standards here, especially when CCST has offered scientific evidence against creating a heating value exemption.

It is worth repeating that CCST found multiple issues with pipeline blending. CCST states that pipeline blending is only effective when there is a

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[133] *Id.*

[134] *Id.*

[135] *Id.*

[136] Cal Advocates on the Assigned Commissioner's Scoping Memo and Ruling at 4.

consistent, unidirectional flow of natural gas at the point of biomethane addition and that this flow of natural gas is large enough, relative to the amount of biomethane, so the mixture will remain in compliance with gas quality specifications.[137] CCST further states that there is a common misconception that the deviation in gas quality is negligible as biomethane will be a small volumetric contribution to the total supply.[138] CCST states that this presumption ignores the fact that any observed effects of biomethane addition to the pipeline will be highly localized near the point of addition.[139] CCST further states that passive mixing may not occur reliably in practice, due to transient or discontinuous injection, causing 'slugs' of out-of-specification gas to arrive erratically at end-user customers.[140]

We find the evidence CCST presented before us compelling and concerning. It is clear that the observed effects of blending are highly localized and complex[141] and the process itself is debated, especially given the risks of unreliable dilution and unpredictable quality changes in the gas consumers ultimately receive.[142] We must be cognizant that CCST concludes that even under very specific conditions blending "might" – not will – allow for safe transit of upgraded gas.[143] The utilities have expressed concern that blending will be

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[137] CCST Study at 83-85.

[138] *Id.*

[139] *Id.*

[140] *Id.*

[141] CCST Study at 83.

[142] *Id.* at 83.

[143] CCST Study at 85.

difficult for them to monitor and may negatively impact the pipeline system and location and magnitude of customer demand.

The safety of blending is contingent on an array of complex, situational factors, and the issue presents risks to pipeline safety if the optimal situational conditions are not met. More evidence must be developed that this is safe at the local level for broader, safe use across our state. More evidence must be gathered and analyzed objectively to meet the high-safety burden to prove these biomethane projects are safe for large-scale operation.

As we stated in D.14-01-034, we will not permit the biomethane suppliers to use an exemption to avoid meeting the gas and biomethane specifications at the time the biomethane is first injected into the common carrier pipeline. Specifications are designed to prevent the entry of non-compliant gas into the utilities' gas pipeline systems. In addition, if the minimum heating value for biomethane is to be met through downstream blending after the biomethane is injected into the common carrier pipeline, this will shift the burden onto the utilities.

Meeting the minimum heating value should be the responsibility of the entity supplying the gas. With downstream blending, the utilities will have to ensure that they have sufficient volumes of gas on hand, with higher heating values, in order to blend the biomethane to meet the minimum heating value. Accordingly, we decline to adopt a heating value exemption at this time.

5. Summary of Conclusions

First, we allow SDG&E and SoCalGas to lower their heating value to 970 BTU/scf from 990 BTU/scf while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas for biomethane provided that a 970 heating value does not create any safety risks for end-user

utility customers or compromise the gas pipeline system. PG&E and Southwest Gas are not subject to the minimum heating value standard adopted here because their tariffs provide for a specific heating value established by the utility for each location.

Second, we maintain the current siloxane limits until there is further evidence to justify modifying the limits, as it is appropriate in the interest of pipeline integrity and safety. Third, we decline to adopt reduced siloxane verification requirements in the interests of public health and safety, pipeline interconnection integrity and safety, and continuity of regulation until there is further evidence and facts that demonstrate safety will not be compromised. Finally, we decline to adopt a heating value exemption process.

6. Comments on the Alternate Proposed Decision.

The alternate proposed decision of President Michael Picker in this matter was mailed to parties in accordance with § 311 and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on May 3, 2019. Reply Comments were filed on May 7, 2019.

This section summarizes the changes to the decision made in response to comments and reply comments on the proposed decision. We do not summarize every comment made, but instead focus on major arguments where we did or did not make revisions in response to party comment.

First, some parties' assert that unresolved issues remain unaddressed and closing the proceeding would preclude consideration of those issues. We disagree. The primary issues to be determined according to Section II of the Assigned Commissioner's Scoping Memo and Ruling have been resolved. The other topics parties wish to address are ripe for further Commission staff and

stakeholder development through the workshop process, which we discuss below.

In Ordering Paragraph 5 of D.16-12-043 we stated that this rulemaking remains open pursuant to Section 784.1(c) to:

> [R]eevaluate the adopted requirements and standards that are to be examined in the study to be undertaken and completed by CCST. After a decision is issued on whether any of the requirements and standards for biomethane injection need to be changed as a result of the CCST study, this Rulemaking may remain open to consider the options to promote in-state biomethane as required by Public Utilities Code Section 784.2, or this Rulemaking can be closed and another proceeding initiated to consider the issues raised by this code section.

Consistent with D.16-12-043, we close this proceeding because we have considered and resolved the results of the CCST Study. This proceeding has been open for six years and its continuation would show a disregard for our statutory mandate to resolve Commission rulemakings in a timely manner, pursuant to Section 1701.5(a).

Consistent with Section 399.24, we will continue to fulfill our statutory obligations to promote the in-state production and distribution of biomethane. The promotion of in-state production and distribution of biomethane will be the focus of an upcoming Energy Division staff workshop to consider an array of issues which may include a standardized interconnection tariff for biomethane, a proposal for defining "renewable methane," a potential injection process for "renewable methane," and hydrogen. These topics are ripe for consideration and development in a workshop setting so that another proceeding may be initiated to consider the issues raised by this code section that is consistent with D.16-12-043.

Finally, Bioenergy Association of California asserts that closing the proceeding would preclude consideration of AB 2313 requirements for the Commission to consider options to increase instate biomethane production and use. We disagree. In 2016, the Legislature passed AB 2313, which enacted Section 399.19, requiring several changes to the Commission's biomethane monetary incentive program. The statute extended the end date from June 11, 2020 until December 31, 2021 and increased the dollar limit per project to attract more participants. Accordingly, the Commission extended the program deadline until December 31, 2021 and increased the per project limits in D.16-12-043. The Legislature ordered that the Commission "shall modify, and extend until December 31, 2021, the monetary incentive program."[144] The statute does not provide an avenue for the Commission to extend the date further. The legislature could have extended the date further, or allowed the Commission to do so, but it declined to do so. For these reasons, no further AB 2313 monetary incentive issues remain in this proceeding. Should the Legislature extend the monetary incentive program beyond the statutory sunset date, the Commission will take appropriate action.

7. Assignment of Proceeding

Clifford Rechtschaffen is the assigned Commissioner and Colin Rizzo is the assigned Administrative Law Judge in this proceeding.

[144] Public Utilities Code Section 399.19.

Findings of Fact

1. "Biomethane" is biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of Health and Safety Code Section 25421 for injection into a common carrier pipeline.

2. Biomethane is made from biological resources, which include biomass, waste including forest and other wood waste, agricultural and food processing waste, organic urban waste, waste and emissions from wastewater treatment facilities, land fill gas and other organic sources.

3. CCST completed a study analyzing the regional and gas corporation specific issues relating to minimum heating value and maximum siloxane specification for biomethane before it can be injected into common carrier gas pipelines, including those specifications adopted in Sections 4.4.3.3 and 4.4.4 of D.14-01-034.

4. SB 840 directed the Commission to reevaluate its requirements and standards adopted pursuant to § 25421 of the Health and Safety Code relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made in the CCST study.

5. CCST does not recommend adopting a 950 BTU/scf minimum heating value because it increases the potential for appliance performance and calibration issues, increases outages and carbon monoxide formation, increases the potential for undercooked food for customers that rely on preset cooking times, and increases the potential for exceeding inert limits, carbon dioxide limits, and interchangeability requirements.

6. CCST states that maintaining the minimum Wobbe Number and relaxing the heating value specification to a level near 970 BTU/scf is unlikely to impact safety or equipment reliability.

7. CCST recommends no change to California's maximum allowable siloxane standard because there is a lack of scientific evidence to justify any change.

8. D.14-01-034 found that siloxane could pose a risk of equipment damage and catalyst poisoning.

9. The observed effects of blending are highly localized, complex, the process itself is debated - given the risks of unreliable dilution and unpredictable quality changes in the gas consumers ultimately receive – and, even under very specific conditions blending may not allow for safe transit of blended gas.

Conclusions of Law

1. Health and Safety Code Section 25421 mandates that the California Public Utilities Commission ensure protection for human health and protecting the integrity and safety of California's natural gas and pipeline facilities.

2. Public Utilities Code Section 399.24 mandates that the California Public Utilities Commission adopt policies and programs that promote the in-state production and distribution of biomethane.

3. Public Utilities Code Section 784.1 requires the California Public Utilities Commission to reevaluate, upon receiving the CCST's biomethane study, its requirements and standards adopted pursuant to Health and Safety Code Section 25421 relative to the requirements and standards for biomethane to be injected into common carrier pipelines and, if appropriate, change those requirements and standards or adopt new requirements and standards, giving due deference to the conclusions and recommendations made by the CCST.

4. Pursuant to Public Utilities Code Section 784.1, the Commission must give due deference to the CCST's determinations.

5. It is reasonable to maintain the minimum Wobbe Number and relax the minimum heating value specification to a level near 970 BTU/scf for SCEand SDG&E, as it is unlikely to impact safety or equipment reliability.

6. We should defer to the CCST's determination that there is not enough evidence available to recommend any changes to the maximum allowable siloxane concentration.

7. It is reasonable for the California Public Utilities Commission to maintain its existing siloxane standard until there is scientific evidence available that warrants a reevaluation of the existing siloxane standard.

8. We would not be fulfilling our duty under Public Utilities Code Section 784.1 and Health and Safety Code Section 25421 if we increased current limits on siloxanes at this time.

9. We would not be fulfilling our duty under Public Utilities Code Section 784.1 and Health and Safety Code Section 25421 if we instituted a reduce siloxane verification regime at this time.

10. We would not be fulfilling our duty under Public Utilities Code Section 784.1 and Health and Safety Code Section 25421 if we permitted a heating value exemption process at this time.

O R D E R

IT IS ORDERED that:

1. San Diego Gas & Electric Company and Southern California Gas Company may reduce the minimum heating value to 970 British Thermal Units

(BTU)/standard cubic feet (scf) from 990 BTU/scf for biomethane while maintaining current minimum Wobbe Number requirements and all other requirements of utility gas tariffs, consistent with Health and Safety Code Section 25421, provided that the lower heating value does not create any safety risks for end-user utility customers or compromise the gas pipeline system.

2. San Diego Gas & Electric Company and Southern California Gas Company -- in compliance with Ordering Paragraph 1 – shall submit their respective Tier 1 advice letters to the Commission's Energy Division, 30 days prior to any change to their respective gas tariffs to show compliance with the 970 British Thermal Units/standard cubic feet minimum heating value for biomethane so long as the current minimum Wobbe Number requirements and all other requirements of utility gas tariffs are met, provided that the lower heating value does not create any safety risks for end-user utility customers or compromise the gas pipeline system.

3. Rulemaking 13-02-008 is closed.

This order is effective today.

Dated _____, at San Francisco, California.